

Nebraska's Approach to Alternatives

2016 National Training Workshop for
CWA 303(d) Listing and TMDL Staff

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June 2, 2016



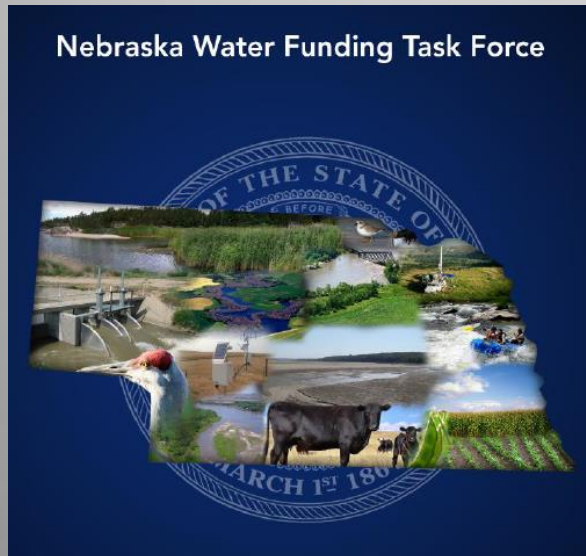
Nebraska Department
of Environmental Quality



Niobrara River confluence with the
Missouri River at Niobrara, NE

The Situation

- TMDL Program Staff = ½ Person
- TMDL Funding = CWA Section 106
- Implementation = Collaboration



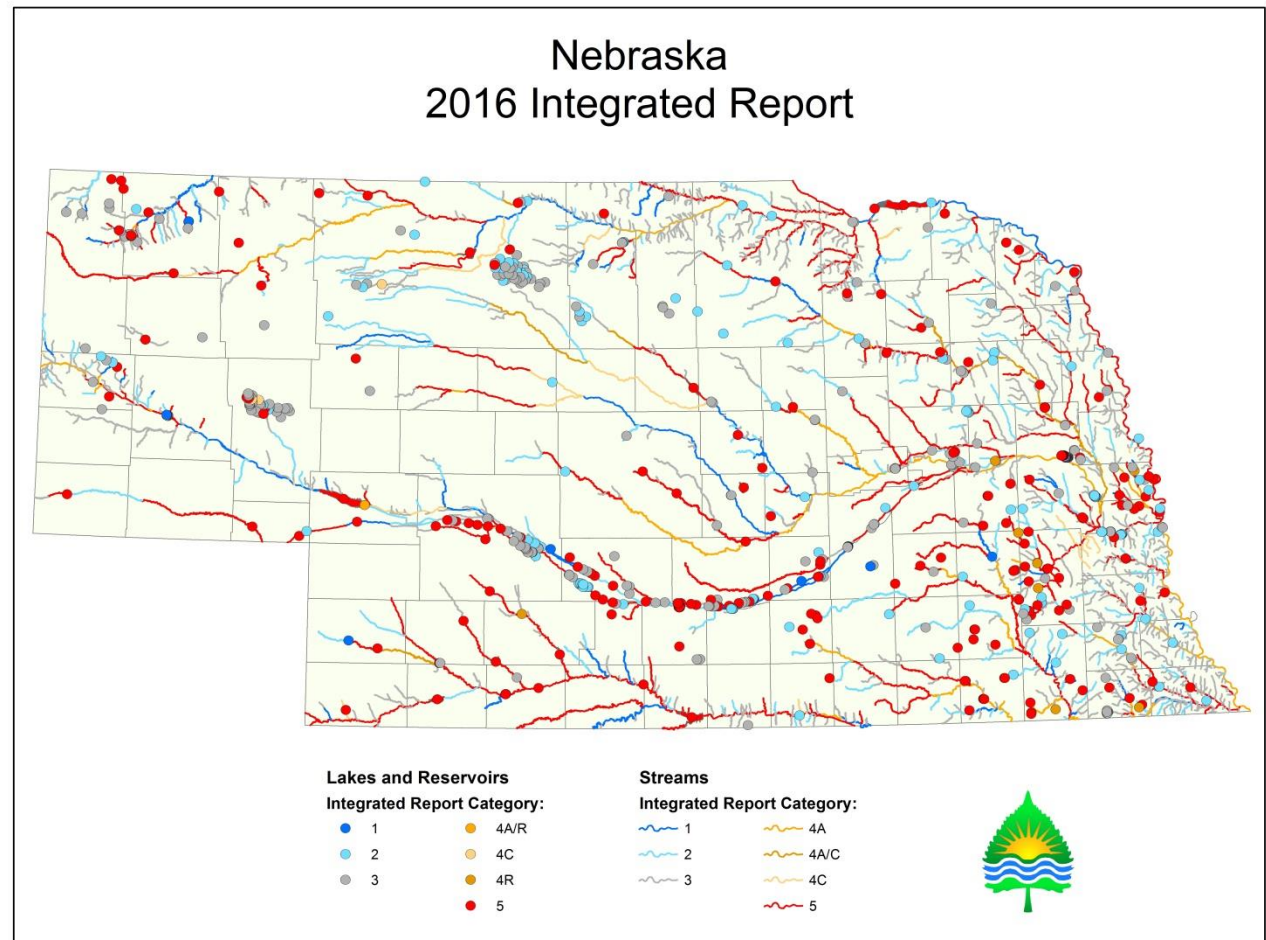
Nebraska's Main Water Quality Issues

Streams

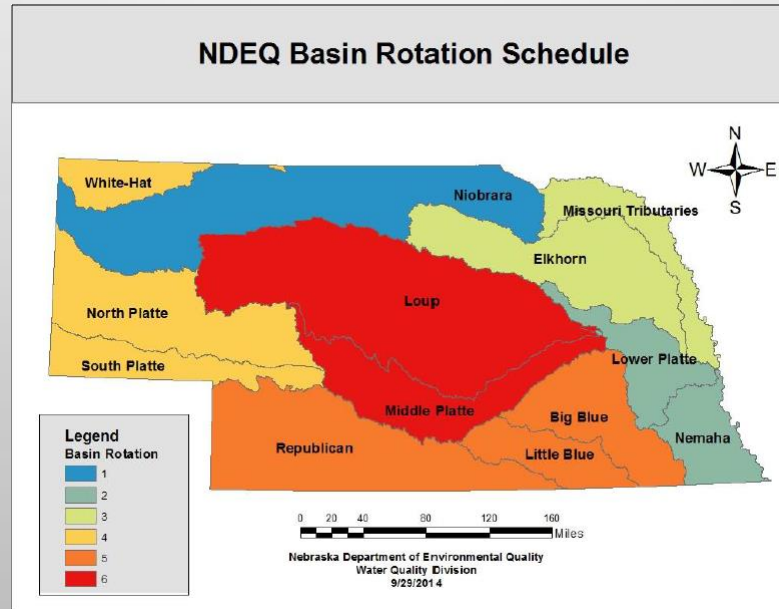
- 179 E.coli
 - (4a 88)
 - **25% 22/88**
- 38 Selenium
 - (4c 6)
- 25 Atrazine
 - (4a 22)
 - **50% 12/25**

Lakes

- 111 Fish Tissue
 - (0) 101 Mercury
- 93 Nutrient
 - (4a 18)
 - **33% 6/18**



Long-Term Vision Priorities



		Social Impact of the Impaired Use			
		High			Low
		Public Drinking Water	Recreation	Aquatic Life	Other
Likelihood of TMDL Implemented	High	Local Government Interested			
		Active Local group interested			
	Low	No Interested parties			

Traditional Restoration Path

1

- State develops TMDL with little in-put and no buy-in from area landowners.



2

- TMDL is set aside until a project sponsor is interested in restoring the waterbody.



3

- Sponsors take key info from the TMDL and they re-do the majority of the document in the plan/project.



Duplication of Efforts

Traditional TMDL (Enforceable) Point Sources

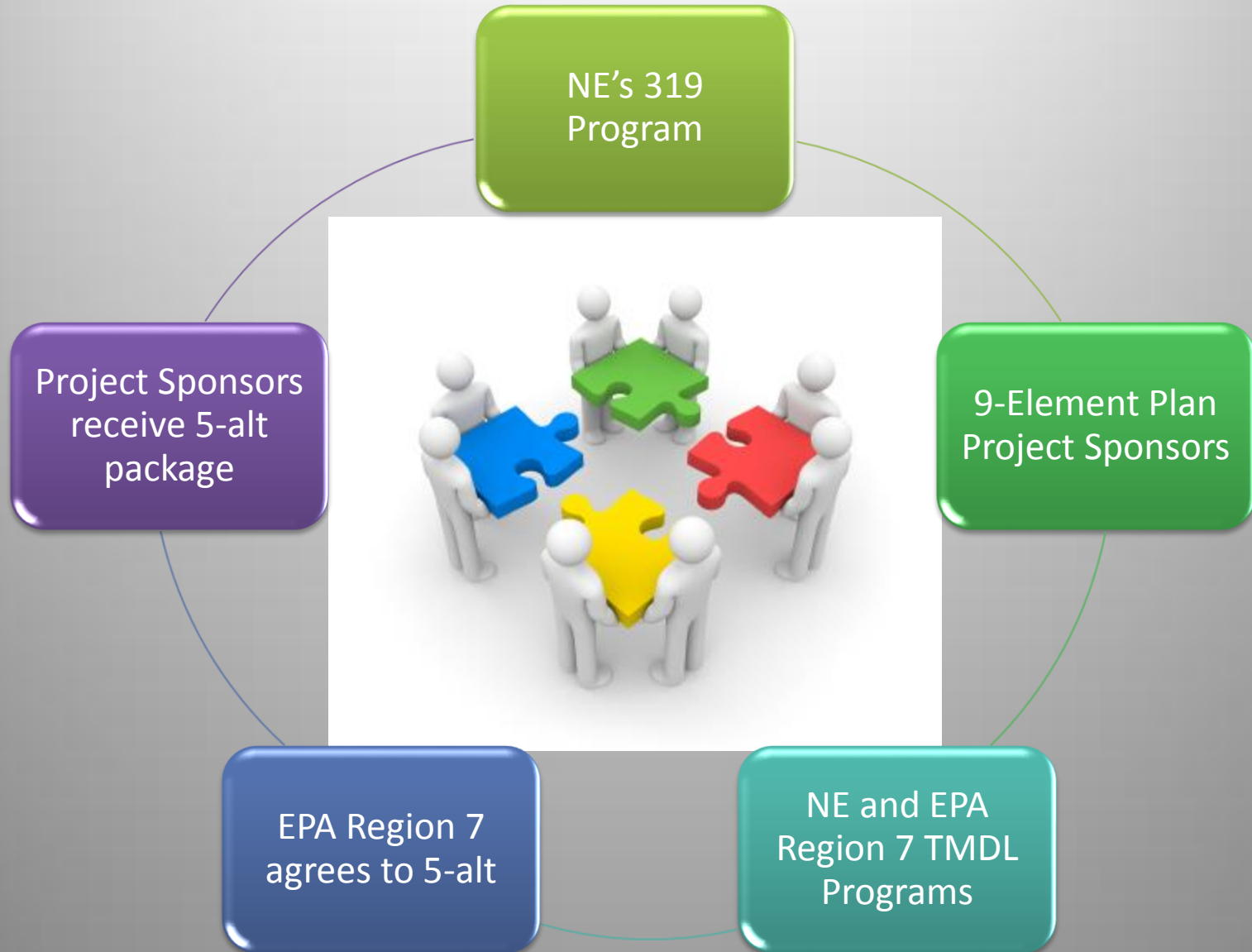
- * Calculate extent of pollution occurring
- * Provide pollutant reductions needed to meet WQS
- * Graph TMDL curve & a hydrograph illustrating flow/pollutant correlations

- * Waterbody description
- * Watershed characterization
- * Pollution source identification
- * Map point and non-point sources
- * Public Involvement

9-Element WMP (Voluntary) Non-point Sources

- * Target Critical Areas
- * Est. needs to fully implement the plan
- * Provide schedule, milestones, and indicators of progress
- * Engage stakeholders and develop I&E component

5-alt Collaborative Approach



South Loup River WMP 5-alt Package

- 1) **Letter:** explaining contents of the package
- 2) **Notes file:** data sources and overall results
- 3) **E.coli file:** data analysis, load reduction %, load duration curves, and NPDES facilities
- 4) **Allocations file:** charts and graphs of results broken into LC, MOS, WLA, and LA
- 5) **Components file:** insertable language with appropriate element locations and references



Pete Ricketts
Governor

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December 10, 2015

Water Quality Partners,

The Nebraska Department of Environmental Quality (NDEQ) has been working with the Environmental Protection Agency (EPA) to create a new alternative to developing Total Maximum Daily Loads (TMDLs) for impaired waterbodies called a 5-alt. The 5-alt alternative was created to address missing TMDLs in areas where project sponsors have targeted for restoration work. EPA and NDEQ have agreed upon a TMDL-like analysis of the relevant water quality data for project sponsors developing 9-element watershed management plans (WMPs). As part of a 9-element WMP, the project sponsor is expected to reference existing EPA-approved TMDLs in addition to utilizing 5-alt data and providing 5-alt graphs and charts in an appendix.

NDEQ will provide the project sponsor a list of EPA-approved TMDLs as well as the following four files:

- 1) Notes file outlining data sources and overall results.
- 2) E.coli file containing the data analysis, load reductions needed to meet water quality standards, load duration curves where possible, and NPDES permitted facilities.
- 3) Allocations file with charts and graphs breaking up the results into the following four sections at various flows.
 - a. The overall Loading Capacity (LC) of the stream.
 - b. The 10% Margin of Safety (MOS) based on the LC.
 - c. Permitted Waste Load Allocations (WLA) from point sources.
 - d. The Load Allocation (LA) - additional pollution the stream can sustain and still remain within the water quality standard.
- 4) Components file with 5-alt language to be inserted in accord with the appropriate element of the 9-element WMP including proper references.

I appreciate your willingness to work with NDEQ and help Nebraska continue to lead the way in efficient and effective water resource management. Please let me know if I can be of any further assistance to you or your staff during the planning process.

Sincerely,
Laura Johnson
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5-alt Notes file

DATA SOURCES									
Data Sources	Flow Data				Location		Drainage Area	Drainage Area	Flow
	Site	Range	Owner	Name	Lat	Long	at gauge (sq mi)	of Segment	Ratio
LO4-10000	6784000	1995-2014	USGS	South Loup River at Saint Michael, NE	41.033	-98.741	2322.1	2322.1	1.00
LO4-20000	6784000	1995-2014	USGS	South Loup River at Saint Michael, NE	41.033	-98.741	2322.1	1433.0	0.62
LO4-30000	6784000	1995-2014	USGS	South Loup River at Saint Michael, NE	41.033	-98.741	2322.1	690.4	0.30
LO4-40000	6783500	1995-2014	USGS/NDNR	Mud Creek near Sweetwater, NE	41.038	-98.993	707.0	350.3	0.50
LO4-50000	6783500	2009-2014	NDNR	Mud Creek near Sweetwater, NE	41.038	-98.993	707.0	239.6	0.34
Data Sources	Water Quality Data				Location				
	Site	Range	Owner	Name	Lat	Long			
LO4-10000	SLO4SLOUP135	2003 08, 13	NDEQ	South Loup River	41.032	-98.740			
LO4-20000	SLO4SLOUP202	2003	NDEQ	South Loup River	41.012	-98.913			
LO4-30000	SLO4SLOUPR30	2008	NDEQ	South Loup River	41.292	-99.885			
LO4-40000	SLO4SLOUP305	2008	NDEQ	South Loup River	41.423	-100.203			
LO4-50000	SLO4SLOUP451	2013	NDEQ	South Loup River	41.498	-100.502			

Impaired Segment	Seasonal Geometric Mean (#/100ml)	E.coli Above Water Quality Standard (#/100ml)	Reductions needed to meet Water Quality Standards	Expected Geometric Mean with the Margin of Safety (#/100ml)
LO4-10000	310	184	64%	112
LO4-20000	392	266	72%	110
LO4-30000	550	424	80%	110
LO4-40000	462	336	76%	111
LO4-50000	170	44	34%	112

5-alt E.coli file

Microsoft Excel screenshot showing a spreadsheet with the following sections:

- Flow Statistics and Loading Capacity:**

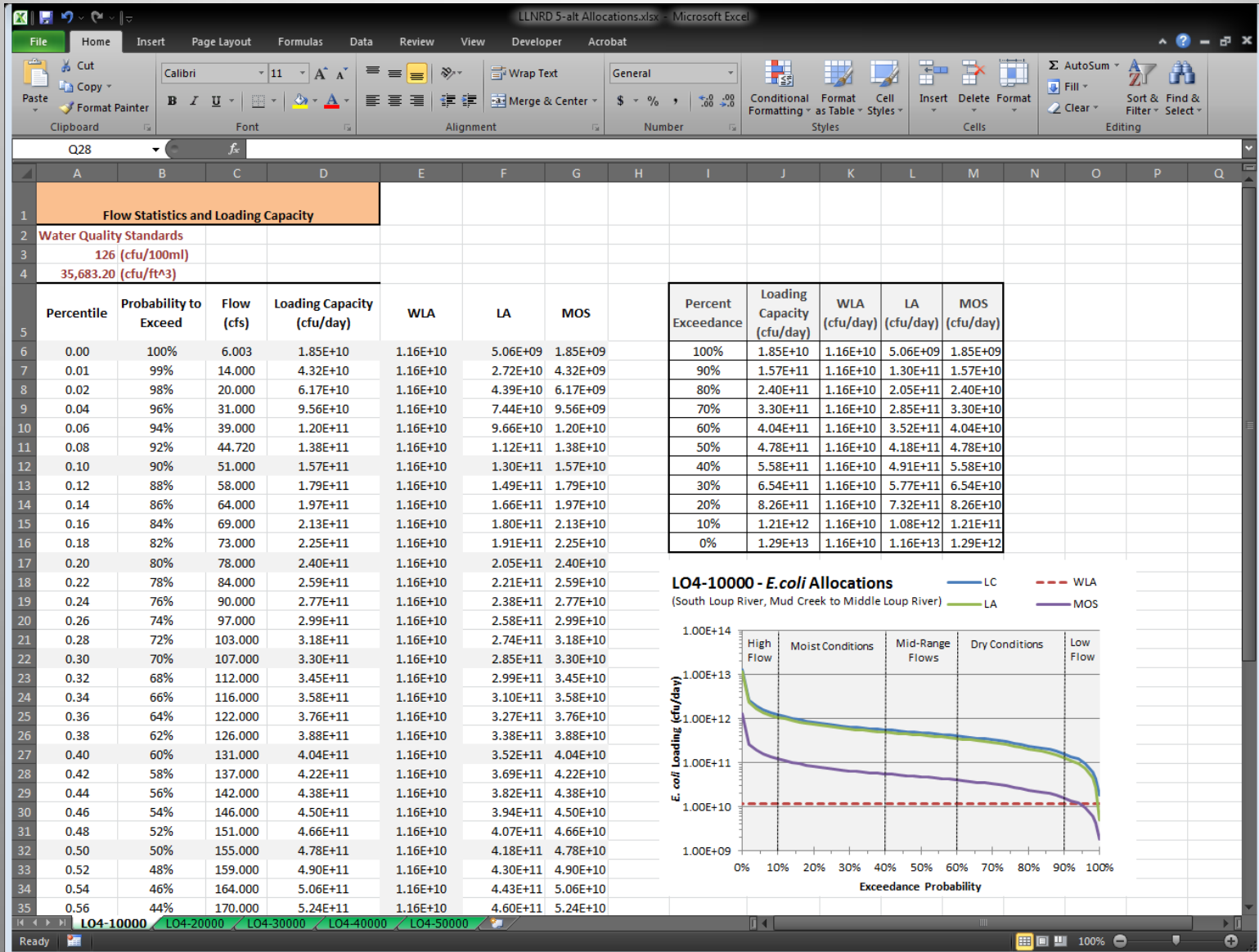
Percentile	Probability to Exceed	Flow (cfs)	Loading Capacity (cfu/day)
0.00	100%	6.003	1.85E+10
0.01	99%	14.000	4.32E+10
0.02	98%	20.000	6.17E+10
0.04	96%	31.000	9.56E+10
0.06	94%	39.000	1.20E+11
0.08	92%	44.720	1.38E+11
0.10	90%	51.000	1.57E+11
0.12	88%	58.000	1.79E+11
0.14	86%	64.000	1.97E+11
0.16	84%	69.000	2.13E+11
0.18	82%	73.000	2.25E+11
- Observed Water Quality Data and Loading:**

Segment	Station #	Date	Observed Flow	Daily Flow from Gate	Consolidated Flow	Flow Percentile	Probability to Exceed [%]	E Coli (cfu/100ml)	Observed Loadings (cfu/day)
LO4-10000	SLO4SLOUP135	5/6/2003	542		542	0.95	5%	15531	2.06E+14
LO4-10000	SLO4SLOUP135	5/13/2003	290		290	0.83	18%	345	2.45E+12
LO4-10000	SLO4SLOUP135	5/20/2003	234		234	0.75	26%	3130	1.79E+13
LO4-10000	SLO4SLOUP135	5/28/2003	280		280	0.81	19%	377	2.58E+12
LO4-10000	SLO4SLOUP135	6/3/2003	181		181	0.60	40%	571	2.53E+12
LO4-10000	SLO4SLOUP135	6/10/2003	188		188	0.62	38%	84	3.86E+11
LO4-10000	SLO4SLOUP135	6/17/2003	152		152	0.48	52%	327	1.22E+12
LO4-10000	SLO4SLOUP135	6/24/2003	252		252	0.78	22%	12033	7.42E+13
LO4-10000	SLO4SLOUP135	7/1/2003	978		978	0.99	1%	683	1.63E+13
LO4-10000	SLO4SLOUP135	7/8/2003	111		111	0.31	69%	299	8.12E+11
LO4-10000	SLO4SLOUP135	7/15/2003	70		70	0.16	84%	243	4.16E+11
- Reductions:**

Current E. Coli (cfu/100ml)	Reduced E. Coli (cfu/100ml)
15531	5591.16
345	124.2
3130	1126.8
377	135.72
571	205.56
84	30.24
327	117.72
12033	4331.88
683	245.88
299	107.64
243	87.48
450	162
181	65.16
262	94.32
332	119.52
15	5.4
16	5.76
40	14.4
712	256.32
169	60.84
146	52.56
2247	808.92
172.6	62.136
2014	725.04
165	59.4
1203.3	433.188
285	102.6
517.2	186.192
613.1	220.716
1732.9	623.844
1986.3	715.068
116.9	42.084
387.3	139.428
29.8	10.728
19.1	6.876
- Facility Name Summary Table:**

Facility Name	NPDES Permits #	Receiving Stream	Design Flow (MGD)	WLA (cfu/day)
Flows into LO4-10000				
Abengoa Nordic Biofuels	NE0133850	LO4-10000	0.382	1.82E+09
Arnold WWTF	NE0028096	LO4-30000	0.06	2.86E+08
BD Vacutainer Systems of Ravenna, LLC	NE0121398	LO4-10200	0.33	1.57E+09
Broken Bow Municipal Light Plant	NE0111708	LO4-10200	0.3	1.43E+09
Broken Bow WWTF	NE0027260	LO4-10200	1.2	5.72E+09
Ravenna WWTF	NE0021547	LO4-10000	0.166	7.92E+08
Sargent Pipe Co. - Broken Bow	NE0049298	LO4-10200	0.002	9.54E+06
Total				1.16E+10
Flows into LO4-20000				
Arnold WWTF	NE0028096	LO4-30000	0.06	2.86E+08
Total				2.86E+08
Flows into LO4-30000				
Arnold WWTF	NE0028096	LO4-30000	0.06	2.86E+08
Total				2.86E+08
Flows into LO4-40000				
None				0.00E+00
Flows into LO4-50000				
None				0.00E+00
- LO4-10000 - E.coli TMDL:**

5-alt Allocations file



5-alt Components Document

Additional 5-alt Components to be included in the 9-element Watershed Management Plan

(Adjust to fit your Watershed Management Plan)

- 1. Demonstration of how the plan is expected to achieve water quality standards more rapidly than pursuing a TMDL in the near term. Add the following to the (element) listed:**
 - **(Management Measures)** By implementing the **ABC NRD Basin** plan it is expected the **ABC NRD** will meet water quality standards quicker than pursuing the development of a TMDL due to active stakeholder interest and investment in implementing BMPs in areas that have been identified in section **X** to be contributing the highest E.coli loads.
 - **(Loadings/Reductions)** Currently the **ABC NRD Basin Watershed** has **Y** E.coli reducing BMPs implemented throughout the watershed. Of the **Y** BMPs currently in place **Z** are located within sub basins determined to be contributing the highest E.coli loads.
- 2. Identification of specific impaired waterbodies addressed by an alternative restoration approach including: NDEQ waterbody ID, impaired use, type of pollutants causing the impairment (both point and nonpoint sources), nature of receiving waterbody, and severity of the pollution (both point and nonpoint sources).**
 - ⇒ NDEQ will provide point source contributions (WLA) data and pollution severity data for waterbodies impaired by E.coli that do not have EPA approved TMDLs to be included in the plan.
 - ⇒ Watershed Management Plans must discuss point sources. NDEQ will provide language to be included in the plan that refers to the NPDES programs responsible to addressing point source contamination. Add:
 - **(Causes/Sources)** Point sources discharge or have the potential to discharge wastewater to waters of the state in the **ABC NRD Basin**. Facility types include: municipal, commercial, and industrial wastewater treatment facilities (WWTF). The facilities that have been issued a National Pollutant Discharge Elimination System (NPDES) Permit (according to EPA's Enforcement and Compliance History Online) in the **ABC NRD Basin Watershed** are listed in Appendix **X** and are shown in Figure **Y**. Under Section 503 of the Clean Water Act (CWA), WWTFs may dispose of sewage sludge through land applications (EPA 1993). Sludge is land applied after proper stabilization and is incorporated into the soil at agronomic rates. Improper or over-application of sludge may potentially cause bacteria impairment to surface water. Nebraska is not a 503 authorized State, therefore administration of section 503 of the CWA falls within the authority of EPA's Bio Solids program.
 - **(Causes/Sources)** Illicit connections, discharges, combined sewer overflows, sanitary sewer overflows, straight pipes from septic tanks or failing septic systems or other failing onsite wastewater systems can also be sources for E.coli bacteria. Under Title 124, Chapter 3, NDEQ requires anyone doing work associated with onsite wastewater

systems be certified by the State of Nebraska and requires systems constructed, reconstructed, altered, or modified to be registered (NDEQ 2012). As of **Month Year** a total of **X** onsite wastewater systems have been registered within the **ABC NRD Basin**. Systems installed prior to 2001 were not required to be registered; therefore the exact number of septic systems or failing septic systems is not possible to determine. According to the National Environmental Services Center it is estimated that 40% of all septic systems are presently failing and about 6% of systems are either repaired or replaced annually (NESC 2013).

- **(Causes/Sources)** Active animal feeding operations (AFOs) are considered potential sources of E. coli bacteria. Figure **Z** shows the AFOs within the **ABC NRD Basin Watershed** that have been entered into the NDEQ database as being inspected. As of **Month Year** there were **X** AFOs within the **ABC NRD Basin Watershed**, see Appendix **Y** for a complete list. Each AFO may have more than one livestock waste control facility (LWCF). An operation that has discharged livestock waste to waters of the State, or has been determined by NDEQ that such a discharge is more likely than not to occur is required to obtain a permit issued by the State of Nebraska for construction and operation of LWCF. These facilities are designed to contain any run off that is generated by storm events that are less than or equal to a 25-year, 24-hour rainfall event.
- 3. Implementation strategy for how the plan is expected to achieve water quality standards. The implementation plan must document actions to address all sources (point and nonpoint), as necessary to achieve water quality standards and include a schedule of actions designed to meet water quality standards (clear major milestones, target dates, including minor interim milestones with clear deliverables). Add:**
 - **(Evaluate Effectiveness)** Achievement of the **ABC NRD Basin** plan endpoints indicate E.coli pollutant loads are within the loading capacity of each impaired stream segment, the water quality standard of 126 cfu/100 ml is attained, and full support of the designated recreational use has been restored.
 - **(Evaluate Effectiveness)** During the 5-year plan update an evaluation will be made as to the degree of implementation that has occurred within the watershed. If **X** unit of BMPs, which were estimated to be needed in order to meet water quality standards, have been installed, the stream will be re-evaluated for possible delisting of the impairment on the **Year** 303(d) list. If not, Phase II of this implementation plan will begin.

References:

EPA 1993. Part 503 – Standards for the Use or Disposal of Sewage Sludge. U.S. Environmental Protection Agency. Office of Water, Washington, D.C.

NDEQ 2012. Title 124 – Rules and Regulations for the Design, Operation and Maintenance of Onsite Wastewater Treatment Systems. Nebraska Department of Environmental Quality, Lincoln, NE.

NESC 2013. National Environmental Services Center web site. National Environmental Services Center. http://www.nesc.wvu.edu/septic_idb/nebraska.htm#septicstats.

Benefits of the 5-alt



ATTENTION!

URGENT!!

Your Opinion is important to us!



South Loup River Watershed Citizens' Survey



The NRDs associated with the South Loup River Basin are working together with property owners and residents to improve water quality and quantity in the South Loup River Watershed.

Information gathered through this online survey will be used in the development of the South Loup Watershed Management Plan; however, no personal or identifying information will be collected.

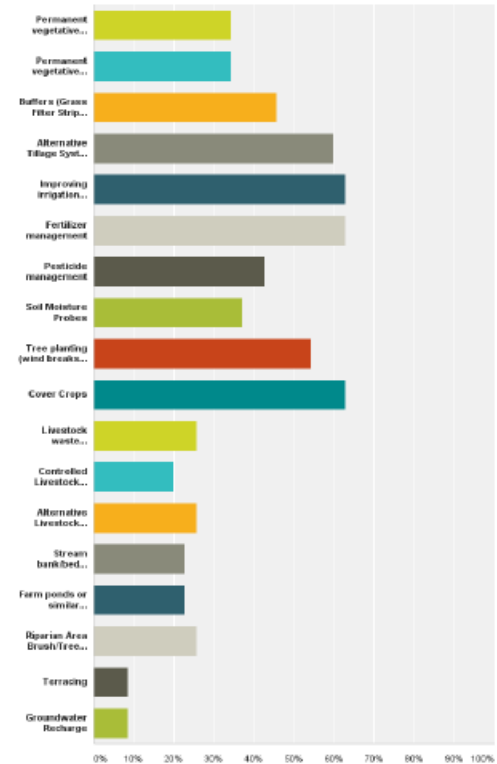
Please take a few moments of your time and fill out the survey on-line at:

<https://www.surveymonkey.com/s/SouthLoup>

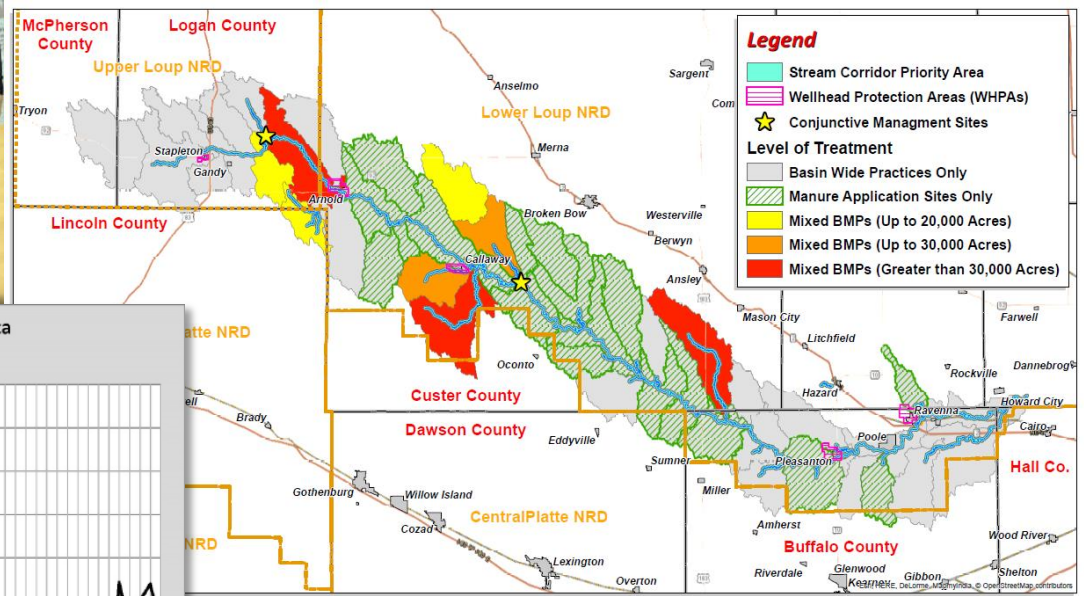
What additional BMPs would landowners/residents be willing to implement?

Q29 The following are some common Best Management Practices (BMPs) which are being considered for implementation within the watershed. Any BMP implemented would be through a partnership with willing landowners. Please mark the BMPs below which you feel would be most beneficial or likely to succeed on your land or as part of your operation. If there are others, please indicate in the blank below.

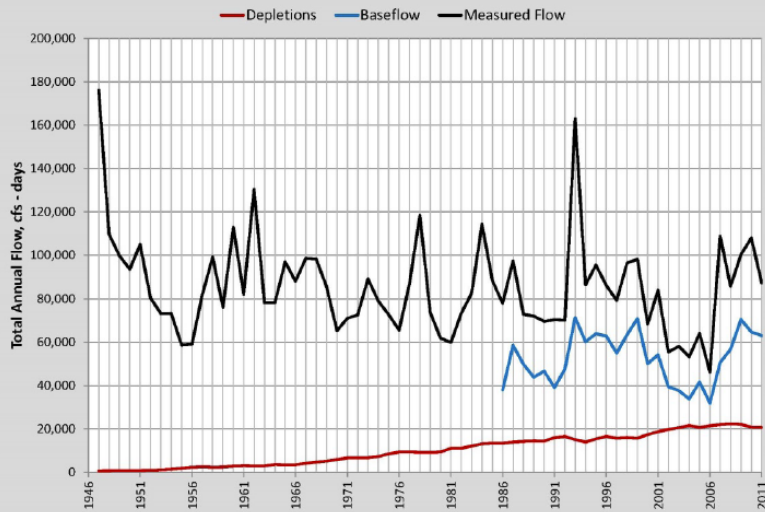
Answered: 35 Skipped: 66



More Benefits of the 5-alt



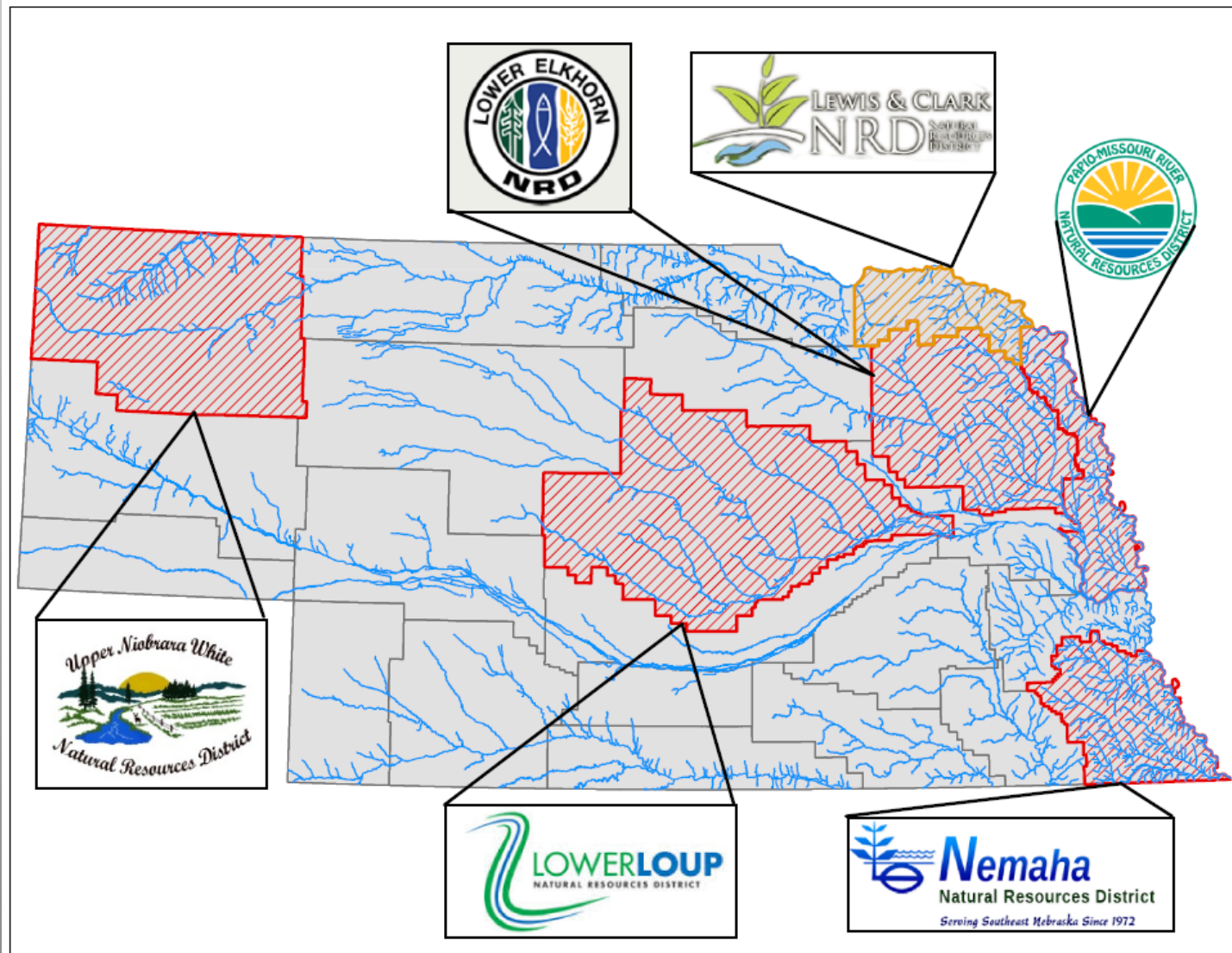
South Loup at St. Michael - Annual Total Flow Data



South Loup River Implementation Targeted Level of Treatment



Current 5-act Partners



Questions?

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